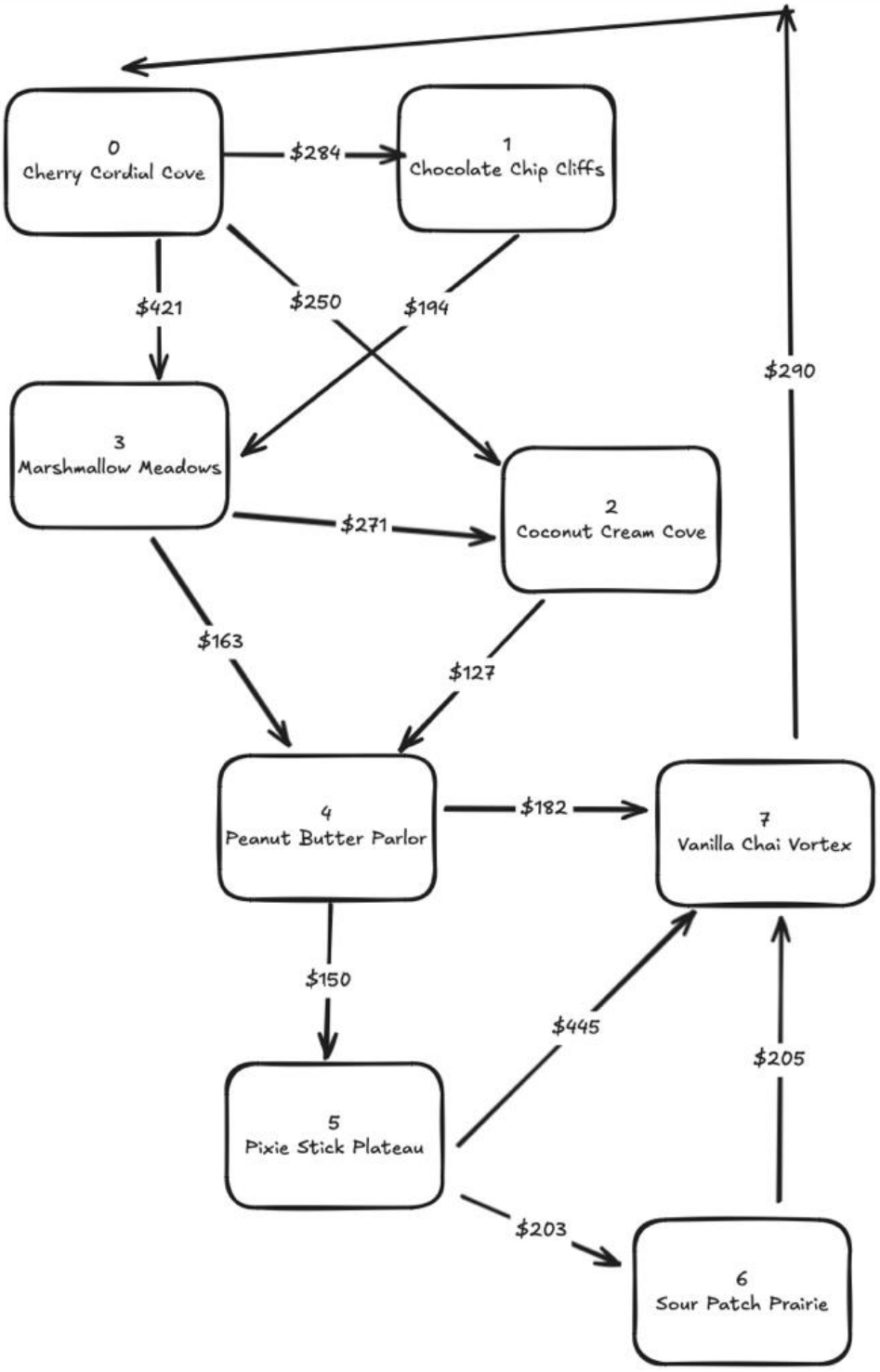
Module 07 – Maximal Flow

Exploratory Data Analysis


0
Cherry Cordial Cove
$284
1
Chocolate Chip Cliffs
$421
$250
$194
$290
3
Marshmallow Meadows
$271
2
Coconut Cream Cove
$163
$127
4
Peanut Butter Parlor
$182
7
Vanilla Chai Vortex
$150
$445
$205
5
Pixie Stick Plateau
$203
6
Sour Patch Prairie

Model Formulation

MAX: X71

Subject to:

+X70 – X01 – X02 – X03 = 0
+X13 – X32 -X34 = 0
+X24 -X47 – X45 = 0
+X57 – X56 -X67 = 0

0 <= X01 <= 284
0 <= X02 <= 250
0 <= X03 <= 421
0 <= X13 <= 194
0 <= X24 <= 127
0 <= X32 <= 271
0 <= X34<= 163
0 <= X47 <= 182
0 <= X45<= 150
0 <= X57 <= 445
0 <= X56 <= 203
0 <= X67 <= 205
0 <= X70 <= inft.

Model Optimized for Maximal Flow

	TO		FROM		
Units of Flow	NODE	Location name	NODE	Location name	Upper Bound
0	0	Cherry Cordial Cove	1	Chocolate Chip Cliffs	$ 284.00
127	0	Cherry Cordial Cove	2	Coconut Cream Cove	$ 250.00
163	0	Cherry Cordial Cove	3	Marshmallow Meadows	$ 421.00
0	1	Chocolate Chip Cliffs	3	Marshmallow Meadows	$ 194.00
127	2	Coconut Cream Cove	4	Peanut Butter Parlor	$ 127.00
0	3	Marshmallow Meadows	2	Coconut Cream Cove	$ 271.00
163	3	Marshmallow Meadows	4	Peanut Butter Parlor	$ 163.00
182	4	Peanut Butter Parlor	7	Vanilla Chai Vortex	$ 182.00
108	4	Peanut Butter Parlor	5	Pixie Stix Plateau	$ 150.00
0	5	Pixie Stix Plateau	7	Vanilla Chai Vortex	$ 445.00
108	5	Pixie Stix Plateau	6	Sour Patch Prairie	$ 203.00
108	6	Sour Patch Prairie	7	Vanilla Chai Vortex	$ 205.00
290	7	Vanilla Chai Vortex	0	Cherry Cordial Cove	$ 999,999,999.00

Optimal solution	$ 290.00

Nodes		Inflow	Outflow	Net Flow	Supply/ Demand
0	Cherry Cordial Cove	290	290	0	0
1	Chocolate Chip Cliffs	0	0	0	0
2	Coconut Cream Cove	127	127	0	0
3	Marshmallow Meadow	163	163	0	0
4	Peanut Butter Parlor	290	290	0	0
5	Pixie Stix Plateau	108	108	0	0
6	Sour Patch Prairie	108	108	0	0
7	Vanilla Chai Vortex	290	290	0	0

This formulation shows that the Optimal solution is 290 Dollars.

Model with Stipulation

Node	Name	Units
0	Cherry Cordial Cove	290
1	Chocolate Chip Cliffs	0
2	Coconut Cream Cove	127
3	Marshmallow Meadows	163
4	Peanut Butter Parlor	290
5	Pixie Stix Plateau	108
6	Sour Patch Prairie	108
7	Vanilla Chai Vortex	290

	TO		FROM		
Units of Flow	NODE	Location name	NODE	Location name	Upper Bound
0	0	Cherry Cordial Cove	1	Chocolate Chip Cliffs	$ 284.00
127	0	Cherry Cordial Cove	2	Coconut Cream Cove	$ 250.00
163	0	Cherry Cordial Cove	3	Marshmallow Meadows	$ 421.00
0	1	Chocolate Chip Cliffs	3	Marshmallow Meadows	$ 194.00
127	2	Coconut Cream Cove	4	Peanut Butter Parlor	$ 127.00
0	3	Marshmallow Meadows	2	Coconut Cream Cove	$ 271.00
163	3	Marshmallow Meadows	4	Peanut Butter Parlor	$ 163.00
182	4	Peanut Butter Parlor	7	Vanilla Chai Vortex	$ 182.00
108	4	Peanut Butter Parlor	5	Pixie Stix Plateau	$ 150.00
0	5	Pixie Stix Plateau	7	Vanilla Chai Vortex	$ 445.00
108	5	Pixie Stix Plateau	6	Sour Patch Prairie	$ 203.00
108	6	Sour Patch Prairie	7	Vanilla Chai Vortex	$ 205.00
290	7	Vanilla Chai Vortex	0	Cherry Cordial Cove	$ 999,999,999.00

To increase the optimal solution, I would increase the capacity of the nodes that are not at capacity (GREEN), rather than increasing the nodes that are not meeting capacity (RED).